Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	
ETC Annual Reports and Certifications	)	WC Docket No. 14-58

To: Chief, Wireline Competition Bureau

SKYBEAM, LLC
REQUEST FOR WAIVER

Skybeam, LLC ("Skybeam"), pursuant to Section 1.3 of the Commission's rules, 47 C.F.R. §1.3, hereby respectfully requests waiver of the Rural Broadband Experiment ("RBE") program obligation to provide service to a specific number of locations in each of the 10 Study Area Codes ("SACs") where it is authorized for support.[1] Based on its extensive good faith analysis, Skybeam has determined that the number of eligible locations the Commission used for the RBE program exceeds the actual number of locations in nine of its 10 SACs. Consistent with the waiver the Wireline Competition Bureau ("Bureau") granted to Allamakee-Clayton Electric Cooperative and Consolidated Communications Networks Inc., the Bureau should find the list of locations to be "reasonably reliable" and authorize a *pro rata* reduction in future support disbursements for the remainder of the support term to account for the fewer number of actual locations it is required to serve.[2] Skybeam further seeks to offset the fewer number of locations in one of its Illinois SACs with the additional number of locations for another of its Illinois SACs.

[1] *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8769, 8791 (2014) ("*Rural Broadband Experiments Order*").

[2] *See Connect America Fund*, Order, 34 FCC Rcd 10308, 10314 (WTB 2019) ("*ACEC-Consolidated Order*").

Background

Skybeam is a wholly owned subsidiary of JAB Wireless, Inc. ("JAB"), the largest privately held fixed wireless Internet service provider ("WISP") in the United States. Operating under the Rise Broadband name, JAB operates throughout rural and suburban sections of sixteen states, extending from the upper Midwest south to the Rio Grande and across the Rocky Mountain states all the way to the California border. JAB uses a combination of licensed, lightly licensed and unlicensed bands to provide cost-effective voice and broadband service.

Through its Skybeam subsidiary, JAB applied for RBE support, and was authorized to receive a total of $16.9 million, the most of any recipient, to help fund 10 projects in five states that it serves – Illinois, Iowa, Kansas, Nebraska and Texas.[3] In each SAC, Skybeam is required to deploy a network capable of delivering 100/25 Mbps and offer at least one service plan that provides 25/5 Mbps to all eligible locations in the Study Area Codes ("SACs") where it is authorized to receive support. RBE support was authorized as follows:

Table 1

Market	SAC	Number of Eligible Locations	Support Amount	Authorization Date
Coal City, IL	346116	1,291	$1,076,282	August 7, 2015
Manville, IL	346117	1,988	$1,504,014	August 7, 2015
Marion, KS	416118	914	$880,216	August 7, 2015
Burton, TX	446119	2,454	$1,066,849	August 7, 2015
Bassett, IA	356134	1,926	$3,550,244	November 12, 2015
Parkersburg, IA	356135	1,528	$2,183,630	November 12, 2015
Columbus, NE	376137	2,761	$2,396,730	November 12, 2015

[3] *See Public Notice,* "Rural Broadband Experiment Support Authorized for Ten Winning Bids for Skybeam, LLC, Consolidated Communications Networks, Inc., Delta Communications LLC, and Allamakee-Clayton Electric Cooperative, Inc., WC Docket Nos. 10-90 and 14-259, DA 15-897 (rel. Aug. 7, 2015); *Public Notice,* "Rural Broadband Experiment Support Authorized for Winning Bids Submitted by Skybeam, LLC, Daktel Communications, LLC, Federated Telephone Cooperative, and Paul Bunyan Rural Telephone Cooperative, WC Docket Nos. 10-90 and 14-259, DA 15-1306 (rel. Nov. 12, 2015); *Public Notice*, "Rural Broadband Experiment Support Authorized for Winning Bid Submitted by Skybeam, LLC," WC Docket Nos. 10-90 and 14-259, DA 16-30 (rel. Jan.12, 2016).

St. Libory, NE	376138	1,188	$1,342,723	November 12, 2015
Corsicana, TX	446139	1,907	$2,372,403	November 12, 2015
Sioux City, IA	356136	794	$569,796	January 12, 2016
TOTAL		**16,751**	**$16,942,887**	

As permitted by the *Rural Broadband Experiments Order*, for each SAC Skybeam elected to receive 30 percent of the total amount of support upfront in exchange for meeting the accelerated deployment obligation of making service available to 25 percent of the eligible locations within 15 months of the first disbursement of support.[4] For each payment following the initial payment, the remaining amount of support is disbursed in equal monthly installments.

As Skybeam has deployed service, it has reported the latitude and longitude of the locations to which it is capable of providing service into the USAC HUBB. As it nears the end of the five-year buildout term for each SAC, Skybeam has conducted an extensive, multi-step process to determine the actual number and geographic location of each location. As explained in more detail in the attached Declaration of Jeff Kohler ("Kohler Declaration") and the supporting evidence attached thereto, this process involved (a) the purchase and use of mapping services from CostQuest Associates ("CQA"), (b) initial verification of the CQA dataset by Skybeam network planners applying definitions prescribed by the *Locations Guidance PN*[5] and visual imagery review, (c) collaboration between Skybeam and CQA to reconcile differences

[4] *See Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8769, 8794 (2014) ("*Rural Broadband Experiments Order*").

[5] *See Public Notice*, "Wireline Competition Bureau Provides Guidance to Carriers Receiving Connect America Fund Support Regarding Their Broadband Location Obligations," 31 FCC Rcd 12900, 12903 (2016) ("*Locations Guidance PN*").

between the CQA data and the Skybeam verification, (d) final resolution of locations to which Skybeam provides service or could provide it within 10 business days upon request.[6]

Skybeam believes that this thorough, time-consuming process reflects an accurate, "reasonably reliable" count of the actual number of locations in each of its SACs. The following table shows the differences between the number of eligible locations the Commission used for the RBE program and the actual number of locations Skybeam has determined through the process outlined above and detailed in the Kohler Declaration:

Table 2

Market	SAC	Number of Eligible Locations	Number of Actual Locations	Difference	Percentage of Actual to Eligible
Coal City, IL	346116	1,291	1,170	-121	90.63
Manville, IL	346117	1,988	2,108	+120	106.04
Marion, KS	416118	914	814	-100	89.06
Burton, TX	446119	2,454	2,208	-246	89.98
Bassett, IA	356134	1,926	1,553	-373	80.63
Parkersburg, IA	356135	1,528	1,424	-104	93.19
Columbus, NE	376137	2,761	2,458	-303	89.03
St. Libory, NE	376138	1,188	1,015	-173	85.44
Corsicana, TX	446139	1,907	1,828	-79	95.86
Sioux City, IA	356136	794	549	-245	69.14
TOTAL		**16,751**	**15,127**	**-1,624**	**90.31**

In light of the foregoing, Skybeam requests waiver of the requirement that it offer service to 100 percent of the eligible locations the Commission identified prior to the date on which Skybeam applied for RBE support. Based on Skybeam's extensive, good faith analysis, it will be impossible to meet those benchmarks because 1,624 locations cannot be identified. Rather than forcing Skybeam to default on its obligations and recovering all of the awarded support, the Bureau should, as it did in the *ACEC/Consolidated Order*, rebase Skybeam's obligations and

[6] *Id*.

awards to reflect the actual number of locations in each SAC that Skybeam has identified – "[d]oing so serves the public interest by helping to ensure the continuing viability of [Skybeam's] networks in serving residential and small business locations while protecting the integrity of the bidding process in producing efficient deployments to consumers."[7]

The amounts of the *pro rata* support reduction can be determined upon grant of the Bureau's order granting this waiver request. To that end, Skybeam seeks to offset the loss of 121 locations for Coal City, IL (SAC 346116) with the gain of 120 locations for Manville, IL (SAC 346117). As the Bureau rightfully concluded, "because the program has less plasticity *[sic]* than other programs: due to the smaller geographic footprint, there is less probability that a loss (or shortage) of actual locations in once census block could be offset by a gain of actual locations in another census block."[8]

Discussion

I. WAIVER WOULD BE CONSISTENT WITH COMMISSION RULES AND THE PUBLIC INTEREST

The Commission may waive a rule for good cause shown.[9] Waiver is appropriate where the "particular facts would make strict compliance inconsistent with the public interest."[10] The Commission may grant a waiver of its rules where the requested relief would not undermine the

[7] *See ACEC/Consolidated Order* at 10314 (footnote omitted).

[8] *Id.* at 10315.

[9] *See* 47 C.F.R. § 1.3.

[10] *See Northeast Cellular Telephone Co., L.P. v. FCC,* 897 F. 2d 1164, 1166 (D.C. Cir. 1990), *citing WAIT Radio v. FCC,* 418 F.2d 1153, 1159 (D.C. Cir. 1969). *See also ACEC/Consolidated* Order at 10313-14; *Connect America Fund*, Order, WC Docket No. 10-90, *et al.*, DA 20-217 (rel. Mar. 3, 2020), at 5&6, ¶¶8&11 (granting waiver to allow carriers to merge study areas in light of "special circumstances [that] warrant a deviation from the general rule and such deviation will serve the public interest"); *Connect America Fund,* 29 FCC Rcd 8769, 8795, ¶77 (2014); *Connect America Fund,* 28 FCC Rcd 2051, 2054 (WCB 2013) (waiving RBE and CAF requirements in Sections 54.202(a)(1)(ii) and 54.313 to file five-year plans).

policy objective of the rule in question, special circumstances warrant a deviation from the general rule, and such deviation will serve the public interest.[11] The Commission may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis.[12]

Skybeam squarely meets this standard. The Kohler Declaration provides a detailed explanation of the efforts Skybeam has taken to assess and verify the actual number of locations in each of its 10 Study Areas. Skybeam selected CQA as its vendor, a third party specializing in identifying serviceable structures, especially in rural areas, utilizing its Broadband Serviceable Location Fabric methodology. Upon its receipt of the initial data it received from CQA, Skybeam applied the Commission's definitional guidance for locations[13] and used accepted geolocation methods, visual imagery and its own methodology to identify and verify the number of locations. This process is consistent with the Broadband Serviceable Locations Fabric pilot program[14] and proposed rules[15] that include visual verification of a certain percentage of locations that cannot be determined with a high degree of confidence. Skybeam found many instances where the inherent limitations of CQA's dataset yielded differences. Following several weeks of collaboration between Skybeam and CQA, Skybeam ultimately determined that the number of locations represented in Table 2 is accurate, and it has reported these locations into the HUBB. Based on the Kohler Declaration and supporting documentation included therewith,

[11] *See generally WAIT Radio*.

[12] *See id.* at 1159; *Northeast Cellular* at 1166.

[13] *See Locations Guidance PN*.

[14] *See* Letter from Jonathan Spalter, USTelecom President & CEO, *et al.*, to Marlene H. Dortch, FCC Secretary, WC Docket Nos. 19-195, 11-10, 10-90 and 19-126 (filed Aug. 20, 2019).

[15] *See Establishing the Digital Opportunity Data Collection,* Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505 (2019).

Skybeam has made "good faith efforts to identify actual locations within the SACs and that such efforts have resulted in a reasonably reliable list that is both accurate and complete" at this time.[16]

For the CAF Phase II program, the Commission determined that "compliance with the deployment obligations will be determined at the state-level for recipients of support through the competitive bidding process. Thus, we will not be looking at whether 95 percent of the eligible locations in a census block have service, nor will we be looking at whether 95 percent of the eligible locations in a given project *within a state* have service."[17] On reconsideration, the Commission directed the Bureau to establish a process for "Phase II auction support recipients to bring to the Commission's attention disparities between the number of locations estimated by the CAM and the number of locations actually on the ground in the eligible census blocks within their winning bid areas *in a state*."[18] Under this process, "in cases where the Bureau has determined by a preponderance of the evidence that there are no additional locations in the relevant eligible census blocks *in the state*, we direct the Bureau to adjust the support recipient's required state location total and reduce its support on a pro rata basis *for that state*."[19] The Bureau subsequently adopted an order establishing the Eligible Locations Adjustment Process.[20]

In the *ACEC/Consolidated Order*, the Bureau acknowledged that RBE recipients "are differently situated from other CAF Phase II recipients in terms of the notice they received

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[16] *ACEC/Consolidated Order* at 10314.

[17] *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949, 5966 (¶46) (2016) ("*Phase II Auction Order*") (footnote omitted) (emphasis added).

[18] *Connect America Fund*, Order on Reconsideration, 33 FCC Rcd 1380, 1389 (2018) ("*Phase II Auction Reconsideration Order*") (emphasis added).

[19] *Id.* (emphases added).

[20] *See Connect America Fund*, Order, 34 FCC Rcd 10395 (2019).

regarding the limitations of CAM inputs and the Commission's expectations regarding their due diligence obligations."[21] It added that, because there is no process for locations discrepancies to be offset at the state level, "RBE support recipients could not limit their risk of noncompliance through calculated and informed bidding strategies in the same way as CAF Phase II auction support recipients."[22] The Bureau found "special circumstances" because "the failure of these RBE petitioners to differentiate between a shortage of locations arising from inaccurate CAM estimates and a loss of locations due to unforeseen circumstances and to demonstrate the requisite level of due diligence in bidding and assessment of locations counts."[23] The facts explained above are precisely the same as those at issue in the *ACEC/Consolidated Order*, and Skybeam has undoubtedly used "good faith" efforts to achieve "reasonably reliable" results.

In addition to these "special circumstances," consistent with its holding in the *ACEC/Consolidated Order*, grant of a waiver to Skybeam will

> ensure that [Skybeam is] able to maintain robust networks and offer broadband service. Were we to deny the waiver request and hold [Skybeam] in default of [its] defined deployment obligations, the Bureau would ultimately order USAC to draw on the letter[s] of credit securing all the support that the petitioner has received and end all support payments, pursuant to the procedures specified in the *Rural Broadband Experiments Order*. Such measures would threaten the ability of [Skybeam] to maintain service in the relevant SACs and are not necessary to reinforce the seriousness of meeting USF obligations in full. In contrast, granting the waiver request and making a pro-rata reduction in support, consistent with the approach recently adopted by the Commission for auction support recipients, ensures that support that cannot be used to serve locations that do not exist within these SACs can be reallocated to future CAF processes.[24]

Accordingly, deviation from the RBE locations service requirement is in the public interest.

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[21] *ACEC/Consolidated Order* at 10315.

[22] *Id.*

[23] *Id.* at 10315-16.

[24] *Id.* at 10316 (citations omitted).

II. SKYBEAM SHOULD BE PERMITTED TO OFFSET ITS ILLINOIS SUPPORT REDUCTION

Skybeam was authorized for support in two Illinois communities – Coal City (SAC 346116) and Manville (SAC 346117). For Coal City, Skybeam identified 121 fewer actual locations than the number of eligible locations the Commission identified for the RBE application process. For Manville, Skybeam identified 120 more actual locations than the number of eligible locations the Commission identified for the RBE application process. The net reduction is one location. Skybeam asks that it be permitted to offset the lower number of locations for Coal City with the higher number of locations for Manville such that the *pro rata* reduction in support would be equal to the per-location amount for one location.

Skybeam should be afforded the same opportunity to offset reductions and gains in actual locations at the state level as CAF Phase II recipients. Skybeam relied on the CAM estimates and the Commission did not, at that time, recognize that the actual number of locations may differ or establish a process to enable discrepancies to be resolved. Here, through its extensive and good faith diligence, Skybeam has determined with reasonable reliability that there are fewer actual locations in Coal City, IL and more locations in Manville, IL. Consistent with the Commission's rationale and actions in the *Phase II Auction Order* and the *Phase II Auction Reconsideration Order*, and as discussed in the *ACEC/Consolidated Order*, fairness and "special circumstances" justify a finding that Skybeam should be permitted to offset its Illinois locations in determining the *pro rata* adjustment for that state.

Conclusion

Given the compelling evidence discussed above and consistent with its *ACEC/Consolidated Order*, Skybeam clearly meets the standards of Section 1.3 and should therefore be subject to *pro rata* adjustments in support for its SACs to reflect the difference between the CAM-determined number of locations and the number of locations Skybeam determined with reasonable reliability through the exercise of good faith.

Respectfully submitted,

SKYBEAM, LLC

By: */s/ Stephen E. Coran*
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April 2, 2020

Overview of Data Contract and Licensing

Rise Broadband and CostQuest (CQA) signed a 14-month End User Licensing Agreement for the Broadband Serviceable Location Fabric (BSLF or Location Fabric). The Agreement terminates January 1, 2021.

The BSLF data includes location coordinates and related data for up to 17,000 broadband serviceable locations that are within Licensee's Rural Broadband Expansion (RBE) markets. The agreement included Visual Verification of a number of records to improve overall accuracy. Rise Broadband received an update of data output to Version 1 of the BSLF.

CQA provided Rise Broadband a separate file for use with USAC Hubb filings.

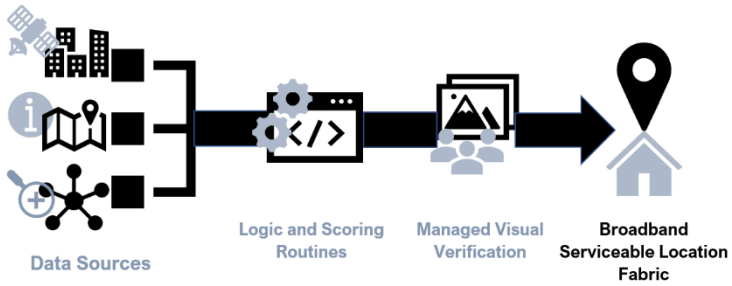
Processes and Methodology

High-Level Processes

The BSLF methodology aggregates data points from many sources, applies statistical scoring, and managed crowdsourcing to pinpoint more precise locations of virtually every structure that is a candidate for broadband.

Data Categories

To create the Location Fabric, multiple data sources, scoring routines, and a managed visual review plan are required. Data sources include: Parcels, property attributes, georeferenced building footprints, and roads.



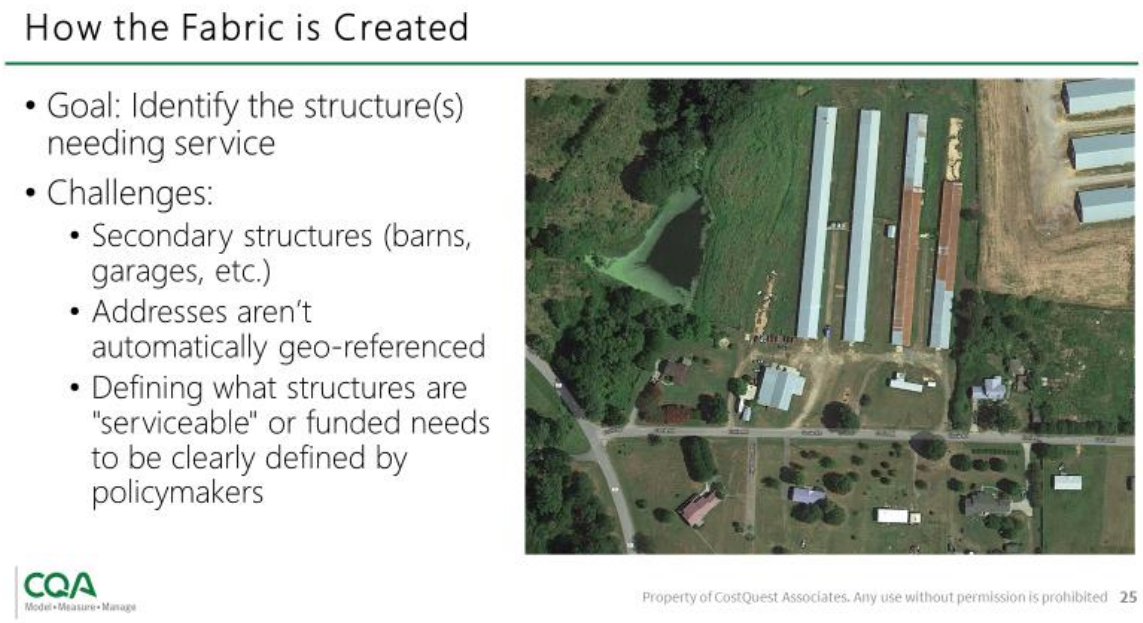
Statistical Scoring and Managed Visual Review

Statistical Scoring provides a level of certainty and managed Visual Review process is used in areas of uncertainty.

While statistical routines applied to various forms of data can guarantee some certainty, there are areas of the country that need a review by a human to provide certainty.

Our Managed Visual Review method is a crowd sourced labor approach. Visual Review is a process of using various managed human resources (including crowd labor) to visually inspect, and/or review specified data
Used areas of uncertainty and provide an acceptable quality level
Can be used to test overall quality
Can be used to form the basis of machine learning
Provides an unbiased result

Visual Representation of Location Fabric Creation



How the Fabric is Created

Step 1:

- Overlay parcel data
- Use Tax Assessor and parcel attribute data to categorize parcels
  - Are there multiple locations?
  - Does the land use indicate there may be a serviceable structure?
  - Consider improvement value, information on secondary structures, etc.

How the Fabric is Created

Step 2:

- Incorporate building footprint data
  - Footprints identify candidate locations for the Fabric
  - Footprints improve the interpolation of textual address data with real-world accuracy of where serviceable structures are

How the Fabric is Created

Step 3:

- Using parcel attribute data and building footprints, logic is applied parcel by parcel to interrogate and aggregate data
- The Fabric identifies serviceable structure(s), circled, on each parcel

CQA Model • Measure • Manage

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The Fabric Compared to Geocoders

Shown: Results of the Fabric compared to two geocoders

- Geocoder A (pink dots) missed two locations and added two extra
- Geocoder B (orange dots) missed four locations
- Poor and inconsistent geocoding hampers deployment, customer service, and compliance reporting

CQA Model • Measure • Manage

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High-Level Methods

Identification of an Organizational Entity

- An organizational entity would often be a single taxable entity such as a residential lot, rural farm, or business center

- For each organizational entity, it is assumed that one point of service should be deployed to the primary serviceable structure and not to any secondary structures unless it is a multi-tenant location

Definition of a Primary Serviceable Structure

- Structure is maintained and safe to enter (ex: not dilapidated or falling down)
- A mostly permanent (including mobile homes, house boats) residence fit for occupancy (ex: Single Family Residence, Apartments, Dormitory, Retirement Home, etc.)
- A place of business where someone would go to work (ex: Restaurant, Office Building, Retail Stores, Lumber Yards, etc.)
- An anchor institution (ex: Police station, government offices, schools, hospitals, etc.)
- A private or public piece of communication infrastructure (ex: Data center, cellular tower, etc.)

Selection of a Primary Serviceable Structure

- Based upon structure's architectural features
- Proximity to structures, infrastructure, or non-structural features
- Context of the surrounding landscape

Identification of Secondary Structures

- Structures considered not primary serviceable structures (ex: Garages, barns, Quonset huts, greenhouses, sheds, utility shacks, storage containers, etc.)

Declaration of Jeff Kohler

My name is Jeff Kohler, and I am the Co-Founder and Chief Development Officer of JAB Wireless, Inc. ("JAB Wireless"). I am making this Declaration in support of a Request for Waiver filed by Skybeam, LLC ("Skybeam"), one of JAB Wireless' subsidiaries. I hereby certify under penalty of perjury that the statements in this Declaration are true and accurate to the best of my knowledge, information and belief.

1. Skybeam is a recipient of rural broadband experiment ("RBE") support for ten Study Area Codes in Illinois, Iowa, Kansas, Nebraska and Texas. Since receiving authorization for support beginning in 2015, Skybeam has been deploying voice and broadband service in each of the Study Area Codes that meet the performance requirements to which Skybeam agreed.
2. In connection with its deployments and certifications regarding the locations to which Skybeam offers service in accordance with FCC standards, Skybeam has undertaken an extensive, multi-step process to identify locations in each of its ten Study Area Codes utilizing a variety of internal and third-party resources, methodologies and datasets. Below is a description of the detailed process and method review utilized to arrive at location numbers for each Study Area Code.
3. Skybeam's process began with application of FCC guidance from the December 8, 2016 Public Notice, DA 16-1363, which the FCC released after authorizing RBE support to Skybeam. In particular, Skybeam applied the definition and examples of "location" to frame its review. Skybeam also followed the FCC's definition of broadband availability: "Broadband service is available if the carrier provides it to the location or could provide it within ten (10) business days upon request." Skybeam also employed desktop geolocation using web-based maps/imagery and visual imagery to verify locations in accordance with USAC guidance.
4. In November 2020, Skybeam engaged CostQuest Associates ("CQA") to assist in the process of determining the number of locations in the ten Study Area Codes and the latitude and longitude of each such location. Skybeam selected CQA based on its industry reputation and its development of the Broadband Serviceable Location Fabric ("Fabric") that CQA used for a broadband mapping pilot program.
5. In January 2020, CQA provided an initial detailed dataset of 15,784 locations utilizing their Fabric process and methodology. A summary of the methodology CQA used for

this aspect of the engagement – its Beta dataset – is attached hereto. For each census block in the Study Area Codes, Skybeam then spatially matched the CQA locations to a Microsoft-produced building polygon dataset of 33,014 structures with rooftops of at least 750 square feet in order to validate CQA locations mapped to a physical structure. Of the 15,784 locations CQA identified, all but 1,646 locations (10.4%) could be matched across both datasets.

6. For the 1,646 CQA locations that could not be matched to the Microsoft building polygon dataset, Skybeam conducted visual review utilizing web-based maps/imagery with ARC GIS and Google Earth Pro. Skybeam disqualified 1,064 location points identified by CQA due to what appeared to be errors such as location points that could not be matched to a serviceable structure (e.g., grain silos, farm fields, or structures with no road, power, etc.). Skybeam manually validated 582 locations as locations. These locations were then digitized and added as polygons to the serviceability data.
7. At the conclusion of the comparisons, manual validation by Skybeam and master list reconciliation, Skybeam produced a revised list of 15,302 locations. The following table describes the output of this initial process:

Initial CQA List (Beta)	15,784
Failed Review	(1,064)
Manually Verified	582
Revised Locations	15,302

8. After review of the CQA Beta dataset, incorporation of Skybeam's feedback and CQA's visual verification, CQA issued a revised dataset (v1) on February 19, 2020 showing 14,735 locations. This revised data was based on CQA's newly released production product that had now moved out of Beta.
9. Rise performed a manual review of every RBE census block utilizing web-based maps/imagery with ARC GIS and Google Earth Pro, the CQA v1 location points, and any location points manually validated during the Beta review. Skybeam identified an additional 1,414 locations not in the CQA v1 dataset by performing the following analysis:
    - Identified 33,014 structures of at least 750 square feet utilizing the Microsoft building polygon dataset, creating an expansive baseline that allows Skybeam to take a granular view into every structure large enough to possibly be a serviceable

location. A significant portion of these structures were manually reviewed or sampled to identify as a serviceable structure to inform further methods below.

- Revised the above dataset to reflect structures of at least 924 square feet, the size of the largest trailer that can fit on a flatbed. This dataset was used and further filtered to remove structures such as grain silos, large sheds, detached garages, etc., resulting in 30,741 structures.
- Additional filters were applied to identify serviceable structures, notating such habitable attributes as:
  - driveways,
  - sidewalks,
  - residential roof design/structure,
  - landscaping,
  - parking areas,
  - power,
  - HVAC,
  - swimming pools,
  - chimneys,
  - other

The revised subtotal as of March 2, 2020 was 16,149.

CQA v1 Locations	14,735
Manually Added	1,414
Revised Locations	16,149

10. From March 6-24, 2020, Skybeam network planners visually reviewed all 16,149 location points to remove duplicates from the CQA/Skybeam datasets and refine locations to unique geographic coordinates that appear to hold a valid residential or a business location. The final result of the study and reconciliation of HUBB entries as of March 31, 2020 reflects 15,127 locations in the RBE census blocks.

CQA v1 Locations	14,735
Failed Review	(2,384)
Manually Verified	2,776
Revised Locations	15,127

Skybeam believes that the methodologies CQA and Skybeam employed and the extensive, multi-step verification process demonstrates good faith efforts to identify every actual location within each of the ten Study Area Codes and that these efforts have resulted in a reasonably reliable list of locations.

/s/ Jeff Kohler
Jeff Kohler

April 2, 2020